

CLAIMS

1 1. A flame resistant fabric, comprising:
2 a plurality of inherently flame resistant fibers that were uncrystallized in fiber
3 form; and
4 a plurality of cellulosic fibers containing a flame retardant compound;
5 wherein said inherently flame resistant fibers comprise a material selected from
6 the group consisting of aromatic polyamide, polyamide imide, polyimide, and mixtures
7 thereof;
8 wherein said cellulosic fibers comprise a material selected from the group
9 consisting of rayon, acetate, triacetate, lyocell, and mixtures thereof.

1 2. The fabric of claim 1, wherein said inherently flame resistant fibers are
2 meta-aramid fibers.

1 3. The fabric of claim 1, wherein said cellulosic fibers are rayon fibers.

1 4. The fabric of claim 1, wherein said fabric contains a residual amount of
2 dye-assistant selected from the group consisting of N-cyclohexylpyrrolidone, benzyl
3 alcohol, N,N-dibutylformamide, and mixtures thereof.

1 5. The fabric of claim 1, wherein said fabric contains a phosphorus
2 compound flame retardant in a concentration of at least approximately 1.4% phosphorus
3 by weight of cellulosic fiber component.

1 6. The fabric of claim 1, wherein said fabric exhibits a duration of afterflame
2 no greater than 2.0 seconds when subjected to a vertical flammability test conducted in
3 accordance with FTMS 191A Method 5903.1 using a three second exposure.

1 7. The fabric of claim 1, wherein said fabric exhibits a shrinkage percentage
2 of no greater than approximately 7% after 20 launderings conducted in accordance with
3 AATCC Test Method 135-1992, Table I (3)(V)(A)(iii).

1 8. The fabric of claim 1, wherein said inherently flame resistant fibers of said
2 fabric have been dyed a shade of color which results in an L value between approximately
3 18 and the greige L value for said fabric if said inherently flame resistant fibers were used
4 to form a fabric composed exclusively of said inherently flame resistant fibers.

1 9. A flame resistant fabric, comprising:
2 a plurality of inherently flame resistant fibers; and
3 a plurality of cellulosic fibers that contain a flame retardant compound;
4 wherein said fabric contains a residual amount of a dye-assistant selected from the
5 group consisting of N-cyclohexylpyrrolidone, benzyl alcohol, N,N-dibutylformamide,
6 N,N-diethylbenzamide, hexadecyltrimethyl ammonium salt, N,N-dimethylbenzamide,
7 N,N-diethyl-m-toluamide, N-octylpyrrolidone, aryl ether, an approximately 50/50 blend
8 of N,N-dimethylcaprylamide and N,N-dimethylcapramide, and mixtures thereof.

1 10. The fabric of claim 9, wherein said dye-assistant is selected from the group
2 consisting of N-cyclohexylpyrrolidone, benzyl alcohol, N,N-dibutylformamide, and
3 mixtures thereof.

1 11. The fabric of claim 9, wherein said inherently flame resistant fibers
2 comprise a material selected from the group consisting of aromatic polyamide, polyamide
3 imide, polyimide, and mixtures thereof.

1 12. The fabric of claim 9, wherein said inherently flame resistant fibers are
2 meta-aramid fibers.

1 13. The fabric of claim 9, wherein said cellulosic fibers comprise rayon,
2 acetate, triacetate, lyocell, or mixtures thereof.

1 14. The fabric of claim 9, wherein said cellulosic fibers are rayon fibers.

1 15. The fabric of claim 9, wherein said fabric contains a phosphorus
2 compound flame retardant in a concentration of at least approximately 1.4% phosphorus
3 by weight of cellulosic fiber component.

1 16. The fabric of claim 9, wherein said fabric exhibits a duration of
2 afterflame no greater than 2.0 seconds when subjected to a vertical flammability test
3 conducted in accordance with FTMS 191 Method 5903.1 using a three second exposure.

1 17. The fabric of claim 9, wherein said fabric exhibits a shrinkage percentage
2 of no greater than approximately 7% after 20 launderings conducted in accordance with
3 AATCC Test Method 135-1992, Table I (3)(V)(A)(iii).

1 18. The fabric of claim 9, wherein said inherently flame resistant fibers of said
2 fabric have been dyed a shade of color which would result in an L value between
3 approximately 18 and the greige L value for said fabric if said inherently flame resistant
4 fibers were used to form a fabric composed exclusively of said inherently flame resistant
5 fibers.

1 19. A flame resistant fabric, comprising:
2 a plurality of inherently flame resistant fibers that were uncrystallized in fiber
3 form; and
4 a plurality of cellulosic fibers that contain a flame retardant compound;
5 wherein said fabric contains a phosphorus compound flame retardant in a
6 concentration of at least approximately 1.4% phosphorus by weight of cellulosic fiber
7 component.

1 20. The fabric of claim 19, wherein said inherently flame resistant fibers
2 comprise a material selected from the group consisting of aromatic polyamide, polyamide
3 imide, polyimide, and mixtures thereof.

1 21. The fabric of claim 19, wherein said inherently flame resistant fibers are
2 meta-aramid fibers.

1 22. The fabric of claim 19, wherein said cellulosic fibers comprise rayon,
2 acetate, triacetate, lyocell, or mixtures thereof.

1 23. The fabric of claim 19, wherein said cellulosic fibers are rayon fibers.

1 24. The fabric of claim 19, wherein said fabric contains a residual amount of
2 dye-assistant selected from the group consisting of N-cyclohexylpyrrolidone, benzyl
3 alcohol, N,N-dibutylformamide, and mixtures thereof.

1 25. The fabric of claim 19, wherein said fabric exhibits a duration of
2 afterflame no greater than 2.0 seconds when subjected to a vertical flammability test
3 conducted in accordance with FTMS 191A Method 5903.1 using a three second
4 exposure.

1 26. The fabric of claim 19, wherein said fabric exhibits a shrinkage percentage
2 of no greater than approximately 7% after 20 launderings conducted in accordance with
3 AATCC Test Method 135-1992, Table I (3)(V)(A)(iii).

1 27. The fabric of claim 19, wherein said inherently flame resistant fibers of
2 said fabric have been dyed a shade of color which would result in an L value between
3 approximately 18 and the greige L value for said fabric if said inherently flame resistant
4 fibers were used to form a fabric composed exclusively of said inherently flame resistant
5 fibers.

1 28. A flame resistant fabric, comprising:
2 a plurality of inherently flame resistant fibers that were uncrystalized in fiber
3 form; and
4 a plurality of cellulosic fibers that contain a flame retardant compound;
5 wherein said fabric exhibits a duration of afterflame no greater than 2.0 seconds
6 when subjected to a vertical flammability test conducted in accordance with FTMS 191A
7 Method 5903.1 using a three second exposure.

1 29. The fabric of claim 28, wherein said inherently flame resistant fibers
2 comprise a material selected from the group consisting of aromatic polyamide, polyamide
3 imide, polyimide, and mixtures thereof.

1 30. The fabric of claim 28, wherein said inherently flame resistant fibers are
2 meta-aramid fibers.

1 31. The fabric of claim 28, wherein said cellulosic fibers comprise rayon,
2 acetate, triacetate, lyocell, or mixtures thereof.

1 32. The fabric of claim 28, wherein said cellulosic fibers are rayon fibers.

1 33. The fabric of claim 28, wherein said fabric contains a residual amount of
2 dye-assistant selected from the group consisting of N-cyclohexylpyrrolidone, benzyl
3 alcohol, N,N-dibutylformamide, and mixtures thereof.

1 34. The fabric of claim 28, wherein said fabric exhibits a shrinkage percentage
2 of no greater than approximately 7% after 20 launderings conducted in accordance with
3 AATCC Test Method 135-1992, Table I (3)(V)(A)(iii).

1 35. The fabric of claim 28, wherein said inherently flame resistant fibers of
2 said fabric have been dyed a shade of color which would result in an L value between
3 approximately 18 and the greige L value for said fabric if said inherently flame resistant
4 fibers were used to form a fabric composed exclusively of said inherently flame resistant
5 fibers.

1 36. A flame resistant fabric, comprising:
2 a plurality of inherently flame resistant fibers that were uncrystallized in fiber
3 form; and
4 a plurality of cellulosic fibers that contain a flame retardant compound;
5 wherein said fabric exhibits a shrinkage percentage of no greater than
6 approximately 7% after 20 launderings conducted in accordance with AATCC Test
7 Method 135-1992, Table I (3)(V)(A)(iii).

1 37. The fabric of claim 36, wherein said inherently flame resistant fibers
2 comprise a material selected from the group consisting of aromatic polyamide, polyamide
3 imide, polyimide, and mixtures thereof.

1 38. The fabric of claim 36, wherein said inherently flame resistant fibers are
2 meta-aramid fibers.

1 39. The fabric of claim 36, wherein said cellulosic fibers comprise rayon,
2 acetate, triacetate, lyocell, or mixtures thereof.

1 40. The fabric of claim 36, wherein said cellulosic fibers are rayon fibers.

1 41. The fabric of claim 36, wherein said fabric contains a residual amount of
2 dye-assistant selected from the group consisting of N-cyclohexylpyrrolidone, benzyl
3 alcohol, N,N-dibutylformamide, and mixtures thereof.

1 42. The fabric of claim 36, wherein said inherently flame resistant fibers of
2 said fabric have been dyed a shade of color which would result in an L value between
3 approximately 18 and the greige L value for said fabric approximately if said inherently
4 flame resistant fibers were used to form a fabric composed exclusively of said inherently
5 flame resistant fibers.

1 43. A flame resistant fabric, comprising:
2 a plurality of inherently flame resistant fibers that were uncrystallized in fiber
3 form; and
4 a plurality of cellulosic fibers that contained a flame retardant compound in fiber
5 form.

1 44. The fabric of claim 43, wherein said fabric contains a residual amount of a
2 dye-assistant selected from the group consisting of N-cyclohexylpyrrolidone, benzyl
3 alcohol, N,N-dibutylformamide, N,N-diethylbenzamide, hexadecyltrimethyl ammonium
4 salt, N,N-dimethylbenzamide, N,N-diethyl-m-toluamide, N-octylpyrrolidone, aryl ether,
5 an approximately 50/50 blend of N,N-dimethylcaprylamide and N,N-dimethylcapramide,
6 and mixtures thereof.

1 45. The fabric of claim 43, wherein said dye-assistant is selected from the
2 group consisting of N-cyclohexylpyrrolidone, benzyl alcohol, N,N-dibutylformamide, and
3 mixtures thereof.

1 46. The fabric of claim 43, wherein said inherently flame resistant fibers
2 comprise a material selected from the group consisting of aromatic polyamide, polyamide
3 imide, polyimide, and mixtures thereof.

1 47. The fabric of claim 43, wherein said inherently flame resistant fibers are
2 meta-aramid fibers.

1 48. The fabric of claim 43, wherein said cellulosic fibers comprise rayon,
2 acetate, triacetate, lyocell, or mixtures thereof.

1 49. The fabric of claim 43, wherein said cellulosic fibers are rayon fibers.

1 50. The fabric of claim 43, wherein said fabric contains a phosphorus
2 compound flame retardant in a concentration of at least approximately 1.4% phosphorus
3 by weight of cellulosic fiber component.

1 51. The fabric of claim 43, wherein said fabric exhibits a duration of
2 afterflame no greater than 2.0 seconds when subjected to a vertical flammability test
3 conducted in accordance with FTMS 1431 Method 5903.1 using a three second exposure.

1 52. The fabric of claim 43, wherein said fabric exhibits a shrinkage percentage
2 of no greater than approximately 7% after 20 launderings conducted in accordance with
3 AATCC Test Method 135-1992, Table I (3)(V)(A)(iii).

1 53. The fabric of claim 43, wherein said inherently flame resistant fibers of
2 said fabric have been dyed a shade of color which would result in an L value between
3 approximately 18 and the greige L value for said fabric if said inherently flame resistant
4 fibers were used to form a fabric composed exclusively of said inherently flame resistant
5 fibers.

1 54. A flame resistant fabric, comprising:
2 a plurality of dyed, inherently flame resistant fibers that were uncolored in fiber
3 form; and
4 a plurality of cellulosic fibers that contained a flame retardant compound in fiber
5 form.

1 55. The fabric of claim 54, wherein said fabric contains a residual amount of a
2 dye-assistant selected from the group consisting of N-cyclohexylpyrrolidone, benzyl
3 alcohol, N,N-dibutylformamide, N,N-diethylbenzamide, hexadecyltrimethyl ammonium
4 salt, N,N-dimethylbenzamide, N,N-diethyl-m-toluamide, N-octylpyrrolidone, aryl ether,
5 an approximately 50/50 blend of N,N-dimethylcaprylamide and N,N-dimethylcapramide,
6 and mixtures thereof.

1 56. The fabric of claim 54, wherein said dye-assistant is selected from the
2 group consisting of N-cyclohexylpyrrolidone, benzyl alcohol, N,N-dibutylformamide, and
3 mixtures thereof.

1 57. The fabric of claim 54, wherein said inherently flame resistant fibers
2 comprise a material selected from the group consisting of aromatic polyamide, polyamide
3 imide, polyimide, and mixtures thereof.

1 58. The fabric of claim 54, wherein said inherently flame resistant fibers are
2 meta-aramid fibers.

1 59. The fabric of claim 54, wherein said cellulosic fibers comprise rayon,
2 acetate, triacetate, lyocell, or mixtures thereof.

1 60. The fabric of claim 54, wherein said cellulosic fibers are rayon fibers.

1 61. The fabric of claim 54, wherein said fabric contains a phosphorus
2 compound flame retardant in a concentration of at least approximately 1.4% phosphorus
3 by weight of cellulosic fiber component.

1 62. The fabric of claim 54, wherein said fabric exhibits a duration of
2 afterflame no greater than 2.0 seconds when subjected to a vertical flammability test
3 conducted in accordance with FTMS 1431 Method 5903.1 using a three second exposure.

1 63. The fabric of claim 54, wherein said fabric exhibits a shrinkage percentage
2 of no greater than approximately 7% after 20 launderings conducted in accordance with
3 AATCC Test Method 135-1992, Table I (3)(V)(A)(iii).

1 64. The fabric of claim 54, wherein said inherently flame resistant fibers of
2 said fabric have been dyed a shade of color which would result in an L value between
3 approximately 18 and the greige L value for said fabric if said inherently flame resistant
4 fibers were used to form a fabric composed exclusively of said inherently flame resistant
5 fibers.